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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,478	09/26/2003	Bertrand Lion	05725.1242-00	7403

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EXAMINER	
PEZZUTO, HELEN LEE	
ART UNIT	PAPER NUMBER
1713	

MAIL DATE	DELIVERY MODE
09/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/670,478	LION ET AL.	
	Examiner	Art Unit	
	Helen L. Pezzuto	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-8,18,26-32,35,72,73 and 75-89* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-8,18,26-32,35,72,73 and 75-89* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/28/07 has been entered.

Response to Amendment

Applicant's amendment to claims 1, 18, 26-28, 35, and 75, and the cancellation of claims 29-17, 19-25, 33-34, and 74 filed in the response on 8/28/07 are acknowledged. Currently, claims 1, 3-8, 18, 26-32, 35, 72-73, and 75-89 are pending in this application.

Regarding claim 89, the examiner queries as to what the scope and meaning of the linear block "ethylene" polymer are?

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3-8, 18, 26-32, 35, 72-73, and 75-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Galleguillos et al. (US-005) or Frechet et al. (US-855 or US-925) or Schimmel et al. (US-883) or Anton et al. (US-206) in view of Graulus et al. (US-446) or Charmot et al. (US-364) or Grubbs et al. (US-666).

US 6,410,005 B1 to Galleguillos et al. discloses AB block copolymer comprising a soft hydrophobic and a hard, hydrophilic blocks with two or more distinct glass transition temperatures, represented by Structures 1 and 2 (col. 4, lines 44-65). Specifically, prior art discloses a process of polymerizing a polyfunctional monomer X within the scope of the instant intermediate block constituent (see col. 4, structures 1 and 2) with a first ethylenically unsaturated monomer(s) to form an A block, and subsequently polymerizing a second ethylenically unsaturated monomer(s) containing at least one carboxylic acid group with the A block to form a B block, and the resultant block copolymer

(col. 3, lines 53-60; col. 4, lines 18-43; col. 5, lines 2-4; col. 6, line 27 to col. 7, line 57). Thus, a copolymer containing blocks of $-(B)_p-X-(B)_q-$, and $-(A)_n-A-X-A-(A)_n-$ is formed, wherein X is a multifunctional monomer that links A and B block. The linkage of X-X reads on the instant intermediate block, wherein X is also a constituent monomer of the A and B blocks in $-(B)_p-X-(B)_q-$, and $-(A)_n-A-X-A-(A)_n-$. Absent of specific compositional and architectural details defined for the instant intermediate block, prior art -B-X-X-A- linkages in structures 1 and 2 fall within the scope of the instant intermediate block as both block A and B contains at least one constituent X, as defined in the present claims. US-005 teaches an average molecular weight of the resultant block copolymer of up to 1,000,000, within the scope of the instant claims 82-86, having film forming property and water dispersibility (col. 6, lines 3-5). Furthermore, patentees disclose a preferred molecular weight of the A block in the range of 10,000 to 150,000, and that of the B block ranges from 1,000 to 50,000 (col. 5, lines 23-29; col. 22, Table 2; col. 36, lines 46-55). Prior art further teaches the weight percent of each of the monomers in the mixture can vary, depending on the desired properties if the final copolymer product. In one

embodiment, patentees disclose 28 wt% to about 60 wt% of monomer A for A block and about 38 wt% to about 60 wt% of monomer B for B block (col. 13, lines 1-8). This clearly encompasses applicant's 50 wt% first block and 45 wt% of second block as expressed in the present claims. Suitable hydrophobic monomer A includes the various (meth)acrylates, (meth)acrylamides expressed in the present claims, with preferred species such as n-butyl acrylate, ethyl acrylate and 2-ethylhexyl acrylate which read on the instant low Tg monomeric species(col. 7, line 65 to col. 9, line 2). Patentees' preferred hydrophilic monomer B include ethylenically unsaturated carboxylic acid such as (meth)acrylic acid, which along with the disclosed alkyl methacrylates, clearly fall within the scope of the instant block having Tg greater than or equal to 40°C (col. 10, line 57 to col. 11, line 30). Prior art specifically disclose using varying proportion of mixtures of A and B monomers so as to achieve the desired balance of the resultant block polymer properties (col. 12, lines 12-15; col. 13, lines 1-8).

US 6,663,855 B2 and US 6,685,925 B2, both to Frechet et al. (reference will be made primarily with respect to the disclosure of US-855) discloses a block copolymer

comprising a core polymer and two or more flanking polymers, wherein at least one of the flanking polymers is a copolymer derived from two or more monomers (abstract). Specifically, prior art block copolymer may have the linear structure of $(AB)_n$-Core, wherein at least one of blocks A and B comprises two or more monomers is hydrophobic and hydrophilic. Typically, component A is a hard block having a high Tg (i.e. preferably from 30 to 150°C), and component B is a soft block having a low Tg (i.e. preferably from 175 to less than 30°C) (col. 3, line 66 to col. 4, line 36). The respective monomer components made up the core and flanking polymers are selected to produce a block polymer with balanced hydrophilic/hydrophobic characteristic (col. 4, lines 55-57). Prior art discloses Mn and Mw of the respective core and flanking polymers and the resultant copolymer within the claimed range (see tables at cols. 23-26). A molar ratio of the core polymer to the flanking polymer from 1:10 to 10:1 is further suggested (col. 5, lines 1-15), clearly encompassing the instant weight percent of first and second blocks. US-925 further teaches preferred embodiments of block copolymers containing up to 85 wt% of the flanking polymers (i.e. within the scope of

the first block) and core polymers (i.e. within the scope of the second block)(col. 8, line 66 to col. 9, line 3). Suitable monomers for the core and flanking polymers are taught within the scope of the present claims (col. 7, line 6 to col. 9, line 49). In the embodiment of A-B-A block copolymer, prior art teaches the transition from each A block to B block maybe tapered such that there may be a gradual compositional change from A block to B block. Furthermore, there may be several monomers in a single block or there may be one or more blocks of random copolymer, referred as to the R block. Prior art discloses polymer architecture of A-R-B-A, A-R-B-R-A, wherein R is random blocks of monomers A and B. Furthermore, patentees suggest the random block may have a compositional gradient of one monomer to the other (i.e. A:B) that varies across the random block. Thus, prior art disclosure clearly suggest R contains a constituent monomer of the A and B block as presently claimed, and hence, embracing the instant intermediate block (US-855, col. 10, lines 13-50). Accordingly, the instant block copolymer comprising at least one first block, second block, linked together via an intermediate block comprising at least one constituent monomer of the at least first block and at least one

constituent monomer of the at least one second block are taught within the scope of prior art block copolymer.

US 6,197,883 to Schimmel et al. discloses a coating composition comprising a block copolymer flow control agent. Prior art block copolymer contains at least a first and a second block, wherein the Tg of second block is at least 20°C greater than that of the first block. The resultant block copolymer contains at least 5 wt% to less than 95 wt% of the first and second blocks (col. 3, line 66 to col. 4, line 21). A weight ratio of the first block to the second block of the copolymer is taught to range from 0.05:1 to 19:1, embraces the recited weight percent of the instant first and second block (col. 4, lines 22-24). The resultant block copolymer has a number average molecular weight of from 500 to 100,000, within those expressed in claims 82-86. Suitable first and second block monomers are derived from C_1-C_{20} alkyl (meth)acrylates (col. 4, lines 22 to col. 6, line 10). Prior art discloses the inclusion of a minor amount of at least one hydroxyl functional ethylenically unsaturated monomer (i.e. hydroxyalkyl (meth)acrylate) in each of the first and second blocks, in a random or gradient fashion (col. 6, lines 11-41). This hydroxy functional monomer may independently occupy at one

or more blocks at any position within either or both of the first and second block in a random fashion or a gradient fashion. This would allow the permutation of the recited block copolymer containing an intermediate block, wherein the hydroxyl functional monomer randomly occupy the first and second block, as well as in the middle of the block. Prior art block copolymer is preferably produced by ATRP method wherein the instant polydispersity index of greater than 2 is clearly obtainable (col. 8, line 56 to col. 9, line 3). A triblock copolymer (IBMA/HPMA)-(2-EHMA/HPMA)-(DMAEMA/HPMA) is exemplified in Example A (col. 23), wherein HPMA falls within the scope of the instant intermediate block constituent. Thus, meeting the requirement of the present block copolymer as defined in the present claims.

US 6,153,206 to Anton et al. discloses a cosmetic composition comprising a synthetic polymer having a first repeating unit derived from methacrylic ester monomer having Tg of -10 to 75°C, and a second repeat unit derived from methacrylic ester monomer having Tg of 76 to 120°C. The resulting polymer can be a block copolymer having a Tg in the range of about 20 to 105°C, and a molecular weight of

5,000 to 300,000 (col. 2, lines 8-23; col. 5, lines 26-28). Patentees disclose a molecular weight of about 20,000 for the first and second repeating units (col. 3, lines 36-44; col. 4, lines 62-67), and a weight portions of the first repeating unit from 2-99 wt% and that of the second repeating unit from 1-98 wt%, and vice versa, in the copolymer (col. 5, lines 1-32). Suitable methacrylic ester monomers used as first and second repeating units fall within the scope of the first and second block monomer species expressed in the present claims (col. 3, line 56 to col. 4, line to col. 5, line 54). Prior art teaches representative architectures of block and random block polymer containing blocks of first and second repeating units with random blocks containing first and second repeating units dispersed between the respective blocks (col. 4, lines 28-60). Thus, encompassing the presently claimed block copolymer containing a first, second and an intermediate blocks as defined in the present claims.

Prior art discussed above provide clear disclosures regarding the method and the selection of various monomers species and their relative proportions in producing block copolymer systems having balance of hydrophilic/hydrophobic properties. The selection of varying amounts of hard and

soft block components with differences in glass transition temperature is suggested within the scope of the present claims. Accordingly, one skilled in the art would have readily envisaged the selection of the suitable monomers having Tg differences as taught, motivated by the reasonable expectation of success in forming block copolymers with balanced hydrophilic/hydrophobic characteristics. Once the respective monomer block components are suggested with Tg consideration, the determination of their optimum proportions or workable ranges taught within the general disclosures of prior art, would involve only routine skill in the art. Some of the references discussed are silent regarding the polydispersity index expressed in the present claims, the examiner is of the position that it would have been obvious and fully within the purview of one having ordinary skill in the art to control the optimum molecular weight, polydispersity, polymer composition and architectures of the resultant block copolymer product by varying experimental parameters such as source, amount, and solvation of catalyst/initiators/control agents, polymerization temperature and time, etc., as shown in ancillary references, US 5,994,446, US 6,518,364 and US

6,410,666, which describes various processes in the production of block copolymer systems. Accordingly, the instant invention as defined in the present claims, is rendered prima facie obvious in view of prior art teachings.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen L. Pezzuto whose telephone number is (571) 272-1108. The examiner can normally be reached on 8 AM to 4 PM, Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Helen L. Pezzuto
Primary Examiner
Art Unit 1713

hlp